

**A NEW SUBSPECIES OF *HYPOCHRYSOPS THEON* C. & R. FELDER  
(LEPIDOPTERA: LYCAENIDAE: THECLINAE) FROM CLAUDIE  
RIVER, CAPE YORK PENINSULA, QUEENSLAND, AUSTRALIA**

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**Abstract**

*Hypochrysops theon johnsoni* subsp. n. is described and figured from Claudie River, Cape York Peninsula. Distinct differences in colouration and maculation separate it from populations of *H. t. medocus* (Fruhstorfer) to the north and *H. t. cretatus* Sands to the south. The three subspecies in Australia are geographically isolated and consistent in their individual phenotypes.

**Introduction**

*Hypochrysops theon* C. & R. Felder occurs from Ternate, Halmahera, Aru, Roon and mainland Papua New Guinea (Parsons 1998) to Australia. Sands (1986) listed seven subspecies plus an unplaced male from Ternate. Two subspecies are currently recognised in Australia: *H. t. medocus* (Fruhstorfer) (= *panaetha* Waterhouse & Lyell) from Cape York to Iron Range and *H. t. cretatus* Sands from Rocky River at the southern end of the MacIlwraith Range (Sands 1986, Braby 2000).

Within this Australian distribution, three disjunct populations are apparent: (1) Lockerbie and Heathlands; (2) Claudie River; and (3) Rocky River. The present authors and Dr C.G. Miller have collected and reared numerous specimens of *H. t. medocus* (Figs 1-4, 9-10) from the Lockerbie region since 2003. The distinctive colouration of both sexes and dark facies of the females led to some speculation as to their relationship with supposed *H. t. medocus* from the Iron Range region.

We examined three males and five females from Lockerbie (collected by I.F.B. Common and M.S. Upton) in the Australian National Insect Collection, Canberra; a male from Heathlands and a female from Bamaga (both Museum of Tropical Queensland Johnson Collection); and two females from Heathlands (both P.S. Valentine Collection). The remarkable consistency of all these specimens, in terms of reduced white areas on the upper and undersides of the wings in both sexes and the deeper blue in the males than those specimens from both the Claudie River environs (Figs 5-6) and Rocky River (Figs 7-8), suggest that three subspecies are involved.

Repository data: ANIC – Australian National Insect Collection, Canberra; CEMC – C.E. Meyer Collection; CGMC – C.G. Miller Collection; DALC – D.A. Lane Collection; MTQJC – Museum of Tropical Queensland Johnson Collection, Townsville (MTQJC); PSVC – P.S. Valentine Collection; QMC – Queensland Museum Collection, Brisbane; RPWC – R.P. Weir Collection; SSBC – S.S. Brown Collection.

*Hypochrysops theon johnsoni* subsp. n.

(Figs 5-6, 11-12, 15-16, 19-20)

*Types: Holotype* ♂, QUEENSLAND: Cape York, Iron Range, em[erged] 5.vi.2005, R.P. Weir, S.S. Brown & C.G. Miller (in ANIC, Canberra). *Paratypes*: 1 ♂, Iron Range, 30.iv.1966, J. MacQueen; 1 ♂, Iron Range, 12.iv.1964, I.F.B. Common & M.S. Upton; 1 ♂, 4 ml. W. Claudie River, 18.xii.1971, D.P. Sands; 1 ♂, 1 ♀, Mt Lamond, Iron Range, 18.ix.1974, G. Daniels; 1 ♂, Iron Range, 17.ix.1982, G. Wood; 1 ♂, same label data but 20.ix.1982; 1 ♀, same label data but 18.ix.1982; 1 ♀, same label data but 8.x.1982; 1 ♀, same label data but 9.x.1982; 1 ♂, 12°44'S, 143°18'E, Phillip Hill, Claudie Riv., 20.ii.1985, E.D. Edwards & B. Hacobain; 1 ♀, Mt Lamond, Iron Range, 20.ix.1975, Andrew Atkins; 1 ♂, Iron Range, 18.ix.1978, Andrew Atkins; 3 ♂♂, Mt Lamond, Iron Range, 26.v.1982-8.vi.1982, JWC d'Apice; 1 ♂, Mt Lamond, Iron Range, 20.ix.1975, Andrew Atkins; 1 ♂, 2 ♀♀, Iron Range, Cape York, em. Sydney, 4.ix.1985, JWC d'Apice; 1 ♀, same label data but em. Sydney, 9.ix.1985; 1 ♀, same label data but em. Sydney, 27.vii.1985; 1 ♀, Iron Range, Cape York, 4-12.vii.1995, JWC d'Apice; 1 ♀, Iron Range, 17-27.viii.1997, JWC d'Apice (in ANIC); 1 ♂, 1 ♀, Ridge to North of the Knoll, Iron Range NP, 29.x.2005, C.E. Meyer & S.S. Brown; 1 ♂, same label data but em. 20.xi.2005; 1 ♂, same label data but em. 23.xi.2005; 1 ♀, same label data but em. 18.xi.2005; 1 ♀, same label data but em. 20.xi.2005; 1 ♂, The Knoll, Iron Range NP, 12°43'37.0"S, 143°17'41.3"E, em. 14.viii.2007, C.E. Meyer & R.P. Weir; 1 ♂, same label data but em. 05.ix.2007; 1 ♀, same label data but em. 17.viii.2007; 1 ♀, same label data but em. 07.ix.2007; 1 ♀, same label data but em. 15.ix.2007; 1 ♀, same label data but em. 24.xi.2007 (in CEMC); 1 ♂, Cape York, Iron Range, em. 28.vii.2005, R.P. Weir, S.S. Brown & C.G. Miller; 1 ♂, same label data but em. 26.vi.2005; 1 ♂, same label data but em. 22.vii.2005; 1 ♂, same label data but em. 23.vii.2005; 1 ♂, same label data but em. 27.vii.2005; 1 ♂, same label data but em. 30.vii.2005; 2 ♂♂, same label data but em. 8.viii.2005; 1 ♂, same label data but em. 29.vi.2005, 1 ♂, same label data but em. 26.vii.2005; 2 ♂♂, Iron Range, Cape York, 15-18.v.2005, S.S. Brown, R.P. Weir and C.G. Miller (in SSBC); 1 ♂, Iron Range, Knoll, 12°43'36"S, 143°17'40"E, em. 28.vii.2005, R.P. Weir, S.S. Brown & C.G. Miller; 1 ♂, same label data but em. 29.vii.2005; 1 ♂, same label data but em. 30.vii.2005; 1 ♀, same label data but em. 26.vii.2005; 1 ♀, Iron Range, Knoll, 12°43'36"S 143°17'40"E, em. 28.vii.2005, S.S. Brown, R.P. Weir & C.G. Miller; 1 ♂, Cooks Hut, Iron Range, em. 14.ix.2007, R.P. Weir and C.E. Meyer; 2 ♂♂, same label data but em. 19.ix.2007; 1 ♂, same label data but em. 21.ix.2007; 1 ♀, same label data but em. 15.ix.2007; 2 ♀♀, same label data but em. 16.ix.2007 (in RPWC); 1 ♂, Iron Range, 13.ix.1981, D.A. Lane; 1 ♂, Iron Range, em. 24.viii.1992, D.A. Lane; 1 ♂, same label data but em. 26.viii.1992; 1 ♂, same label data but em. 28.viii.1992; 1 ♂, same label data but em. 13.vii.1993; 1 ♂, same label data but em. 3.viii.1993; 1 ♀, same label data but em. 31.vii.1984; 1 ♀, same label data but em. 4.viii.1984; 1 ♀, same label data but em. 8.viii.1984; 1 ♀, same label data but em. 24.viii.1984; 1 ♀, same label data but 14.viii.1992; 1 ♀, same label data but em. 15.viii.1992 (in DALC); 1 ♂, Mt Lamond, Iron Range, 2.viii.1977, C.G. Miller; 1 ♂, same label data but 3.viii.1977; 1 ♂, same label data but 26.v.1982; 1 ♂, same label data but em. 11.vii.1995; 1 ♂, same label data but em. 11.vi.1998; 1 ♂, same label data but em. 14.vii.2004; 1 ♀, same label data but 6.viii.1977; 1 ♀, same label data but 3.vi.1982; 1 ♀, same label data but em. 23.viii.1999; 1 ♀, same label data but em. 9.ix.1999; 1 ♀, same label data but 1.ix.2001; 1 ♀, same label data but

25.v.2002 (in CGMC); 2 ♂♂, 1 ♀, Iron Range, Cape York, 1-10.vii.1980, A.J. & I.R. Johnson; 1 ♂, same label data but 25.vii.1987; 1 ♂, same label data but 27.viii.1987; 1 ♂, same label data but em. 16.x.1989; 1 ♀, same label data but 12.vii.1987; 1 ♂, Iron Range, Cape York, 5-20.vii.1983, A.J. Johnson; 1 ♀, Claudie River, Cape York, 1-8.vii.1978, S.J. & A.J. Johnson; 2 ♂♂, Phillip Hill, Iron Range, em. 12-19.vii.1993, S.J. Johnson; 1 ♀, Iron Range, Cape York, 7.viii.1981, S.J. Johnson; 1 ♀, Iron Range, Cape York, 20.vii.1981, A.J. Johnson; 1 ♀, same label data but 18.viii.1982 (in MTQJC); 1 ♂, Iron Range, 09.vii.1983, P.S. Valentine; 1 ♂, same label data but 9.viii.1983; 1 ♂, same label data but em. 11.viii.1983; 1 ♂, same label data but em. 12.viii.1983; 1 ♂, 1 ♀, same label data but, em. 22.viii.1984; 2 ♂♂, same label data but em. 8.viii.1984; 1 ♂, same label data but em. 18.viii.1984; 1 ♂, same label data but em. 03.ix.1992; 1 ♀, same label data but em. 30.viii.1983; 1 ♀, same label data but em. 10.viii.1983; 1 ♀, same label data but em. 23.viii.1983; 1 ♀ same label data but em. 18.vii.1984; 1 ♀, same label data but 18.vii.1984; 1 ♀, same label data but em. 20.viii.1983; 1 ♀, same label data but em. 05.viii.1993 (in PSVC); 1 ♂, Iron Range, Cape York Peninsula, larva coll. 10.vii.1995, P. Wilson; 1 ♂, Iron Range, em. 21.viii.1983, P.S. Valentine; 1 ♂, Phillip Hill, em. 7.viii.2000, T. Lambkin; 1 ♀, Iron Range, vii.1983, P.S. Valentine (in QMC).

*Description.* Male (Figs 5-6). Antennal length (holotype) 9.2 mm; average antennal length 9.9 mm (n = 19); shaft black with segmental bands very faint metallic green, club black basally broadening before narrowing to paler tip. Head dorsally black with small metallic green spot above eyes. Labial palpi white. Thorax black with overlay of blue scales. Abdomen dorsally black with segmental bands white, ventrally white. Wingspan (holotype) 31 mm; average wingspan 31.5 mm (n = 19).

Forewing upperside metallic azure blue in subcostal, subterminal and tornal areas enclosing a purple-blue central area within which lies a broad white area between base,  $M_1$  above and  $CuA_2$  below; veins in this white area with metallic blue scales; costa, apex and terminal band black narrowing from apex to tornus; cilia black, very faintly tipped white between  $M_2$  and  $CuA_2$ . Hindwing with termen strongly bowed towards apex, metallic azure blue; costa between  $Sc+R_1$  and  $M_1$  white; terminal band black broadening towards apex, extending basally towards cell between  $M_1$  and  $M_2$ ; cilia black with white tips between veins. Forewing underside white, apical, costal area and radius metallic green with black scales on veins, a narrow black band between subcosta and radius, black subapical bar between costa and  $M_2$  not touching terminal band; terminal band black with metallic green, crescent-shaped marks between veins. Hindwing underside metallic green, small black subbasal band not extending to half length of costa; black submedian band between dorsum and  $M_3$  parallel to subbasal band; black postmedian band between  $3A$  and  $M_2$  displaced terminally between  $CuA_1$  and  $M_2$  and more so between  $M_3$  and  $M_2$  so as to be not parallel to other two black bands; broad white patch between apex, costa and subbasal band; terminal band black with broken metallic green band between veins.



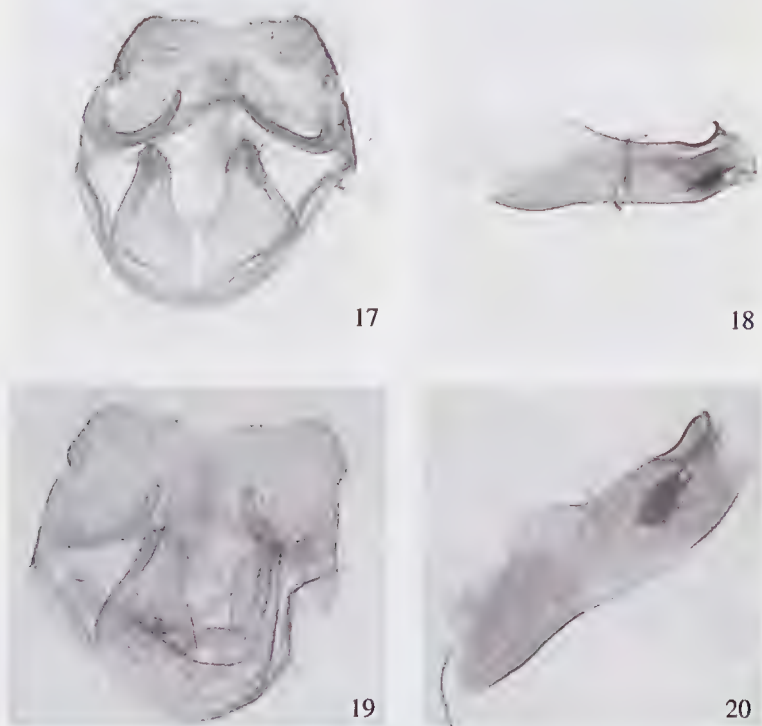
**Figs 1-8.** *Hypocrysops* spp., males. (1) *H. theon medocus* holotype, upperside; (2) *H. theon medocus* holotype, underside; (3) *H. theon medocus* from Lockerbie, upperside; (4) *H. theon medocus* from Lockerbie, underside; (5) *H. theon johnsoni* holotype, upperside; (6) *H. theon johnsoni* holotype, underside; (7) *H. theon cretatus* holotype, upperside; (8) *H. theon cretatus* paratype, underside.



**Figs 9-16.** *Hypocrypsops* spp., females and early stages. (9-14) females: (9) *H. theon medocus* from Lockerbie, upperside; (10) *H. theon medocus* from Lockerbie, underside; (11) *H. theon johnsoni* paratype, upperside; (12) *H. theon johnsoni* paratype, underside; (13) *H. theon cretatus* paratype, upperside; (14) *H. theon cretatus*, underside (DALC). (15-16) early stages: (15) *H. theon johnsoni*, final instar larva; (16) *H. theon johnsoni*, pupa.

Female (Figs 11-12). Average antennal length 9.9 mm ( $n = 24$ ); colour of antennae similar to male but with faint white segmental rings. Palpi, thorax and abdomen as in male. Average wingspan 33.4 mm ( $n = 24$ ); costa, termen and apex more rounded than in male; upperside colour creamy white with black scales on veins, broad black costal, apical and terminal areas, dusting of blue scales in costal and subapical black areas and between 1A+2A and dorsum. Hindwing more rounded than in male but with termen similarly strongly bowed towards apex; colour black with broad costal creamy white area extending to apex; blue dusting along veins basally, most prominent between  $M_3$  and  $CuA_2$ . Forewing and hindwing underside as in male with broader terminal green and central area more creamy white.

Male genitalia (Figs 19-20). Fruhstorfer (1908) and Sands (1986) described the genitalia of *H. t. medocus* and *H. t. cretatus* respectively. There are no discernable differences in the genitalia of the three subspecies.



Figs 17-20. *Hypocrysops* spp., male genitalia (17, 19) and lateral view of aedeagus (18, 20). (17-18) *H. theon medocus*; (19-20) *H. theon johnsoni* subsp. n.

*Life history* (Figs 15-16). Daniels (1976) described the early stages, life history and larval food plant (*Drynaria quercifolia*: Polypodiaceae) of the Claudie River population. There are no discernable differences in the immature stages between it and other populations within Australia. Final instar larvae and pupae of all three subspecies are similar in appearance.

*Etymology*. The name recognises the contribution made by Dr Steve Johnson over 30 years in the study of the butterfly fauna of Iron Range.

## Discussion

The type specimen of *H. t. medocus* is in The Natural History Museum, London (BMNH) and bears the data 'Queensland Australia ex coll Fruhstorfer'. Comparison of that specimen (Figs 1-2) with specimens from Claudie River (Figs 5-6) and the Lockerbie area (Figs 3-4) indicates that the type specimen must have come from the Lockerbie-Heathlands area, based on the distinctive appearance of the Lockerbie males. It is remotely possible that the type specimen could have come from the historical location of Prince of Wales Island (S.J. Johnson pers. com.). Fruhstorfer was apparently based in that area for some time prior to 1913 and was not known to have collected at Claudie River (E.D. Edwards pers. com.). It has been noted (Sands 1986, Braby 2000) that specimens of *H. t. medocus* from northern Cape York Peninsula are darker than those from Claudie River.

The lectotype of *Miletus panaetha* Waterhouse & Lyell is also from 'Cape York' and was collected by H. Elgner in March 1906 (Waterhouse and Lyell 1909, Sands 1986). This name, regarded as a synonym of *H. t. medocus* since Waterhouse (1937), thus also applies to the northern population.

*H. t. johnsoni* (Figs 5-6, 11-12) can be distinguished from *H. t. medocus* (Figs 1-4, 9-10) by the following characters. Colour: brighter, lighter blue. Male forewing upperside: more extensive central white area and black costal area extending more basally. Male hindwing upperside: more strongly bowed termen towards apex (this gives *H. t. johnsoni* a more elongated and angular appearance); more extensive costal white area. Forewing underside: smaller black apical area, which does not touch the terminal band, broader black subcostal area, and more extensive apical green area. Hindwing underside: more extensive apical and costal white area, smaller and more basally situated black sub-basal band, postmedian black band with segments between  $CuA_2$  and  $M_3$ , and between  $M_3$  and  $M_2$  displaced terminally so as to render it not parallel to the other two black bands and narrower terminal green band. Female upperside: more bowed costa in both wings, more extensive white areas in both wings and with less blue overlay and black veins in the forewing. The sub-marginal green band on the underside of both wings is much narrower in both sexes in *H. t. johnsoni* than in *H. t. medocus*.

The overall appearance of *H. t. johnsoni* is much paler than that of *H. t. medocus*. This is evident not only when dead specimens are examined but can

also be seen in flight (C.G. Miller pers. obs.). Overall, the white areas are more extensive in both sexes and the blue of the male upper side is lighter. The description of *H. t. johnsoni* as a distinct subspecies provides a clear view of the phenotypic change in the species from north to south. The Papua New Guinea forms are predominantly dark and, in Australia, the geographic isolation of the three populations has maintained distinctive forms that are consistent within each area. That no specimens have been recorded in the intervening areas (due possibly to the absence of suitable habitat) supports the recognition of these three populations as distinct subspecies.

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The authors thank Mr Ted Edwards (ANIC) for general discussion on this matter, genitalia dissections and for access to specimens in the ANIC, Ms Vanna Rangsi (ANIC) for the photographs of the genitalia, Ms Kim Goodger and Jim Reynolds (BMNH) for help in locating the type of *H. t. medocus* and providing the images of that specimen and the label data, Queensland National Parks and Wildlife service for permits to undertake work in areas under their control and Dr C.G. Miller for his company in the field and comments on the initial draft of the manuscript.

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